REMARKS

The Office Action mailed April 19, 2007 has been carefully considered. Reconsideration in view of the following remarks is respectfully requested.

Claims 12-44, 46, and 51-70 are currently pending. No claims are allowed.

Claims 38-40 have been amended to further particularly point out and distinctly claim subject matter regarded as the invention. Support for these changes may be found in the specification and figures as originally filed.

Claims 1-11, 45, and 48-49 were previously canceled, without prejudice or disclaimer of the subject matter contained therein.

With this Amendment it is respectfully submitted the claims satisfy the statutory requirements.

Informal Objections

Claims 38 – 40 stand objected to for various informalities.[1] With this Amendment, Claims 38 and 40 have been amended accordingly. Withdrawal of the objection to Claims 38 – 40 is respectfully requested.

The 35 U.S.C. § 101 Rejection

Claims 12, 16, 25, 29, 38, 39, 41 and 46 stand rejected under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter.[2] This rejection is respectfully traversed.

---

[1] Office Action mailed April 19, 2007, p. 2.

Claims 12, 16, 25, 29, 38, 39, 41 and 46

The Examiner states:

> Claims 12, 16, 25, 29, 38, 39, 41, and 46 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claimed invention as a whole does not accomplish a practical application. That is, it must produce a tangible result". The tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing. However, the tangible requirement does require that the claim must recite more than a 35 U.S.C. 101 judicial exception, in that the process claim must set forth a practical application of that judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77 (invention ineligible because had "no substantial practical application."). "[A]n application of a law of nature or mathematical formula to a ... process may well be deserving of patent protection." Diehr, 450 U.S. at 187, 209 USPQ at 8 (emphasis added); see also Corning, 56 U.S. (15 How.) at 268, 14 L.Ed 683 ("It is for the discovery or invention of some practical method or means of producing a beneficial result or effect, that a patent is granted . . ."). In other words, the opposite meaning of "tangible" is "abstract."
>
> In this case, claims 12, 16, 25, 29, 38, 39, 41, and 46 are directed to an " abstract idea" because they do not represent a practical application of the idea. Such claims are lacking "tangible results". There are no tangible results being produced. Therefore, claims 12, 16, 25, 29, 38, 39, 41, and 46 are non-statutory.[3]

The Applicant respectfully disagrees for the reasons set forth below.

Claim 12

Claim 12 recites:

> A method for handling a control message in a Virtual Local Area Network (VLAN), the method comprising:
> receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router;
> updating a source-group data structure using information from the control message, the source-group data structure containing data regarding a multicast group; and
> adding an outgoing port index to said source-group data structure, said outgoing port index identifying a port that received the control message.

---

[2] Office Action at p. 2.
[3] Office Action at pp. 2-4.

According to the U.S. Patent and Trademark document entitled "Examination Guidelines for

Computer-Related Inventions,"

> There is always some form of physical transformation within a computer because a computer acts on signals and transforms them during its operation and changes the state of its components during the execution of a process. Even though such a physical transformation occurs within a computer, such activity is not determinative of whether the process is statutory because such transformation alone does not distinguish a statutory computer process from a non-statutory computer process. What is determinative is not how the computer performs the process, but what the computer does to achieve a practical application.[4]

Embodiments of the invention as currently claimed provide a method and system for intelligently

forwarding multicast packets by a layer 2 switch.[5] This practical application is made possible by

the steps recited in Claim 12. This practical application is also reflected in Claim 12, which

clearly recites the receipt of a control message at a layer 2 switch, where the control message was

sent by a layer 3 router. And further, Claim 12 recites updating a source-group data structure

using information from the control message, and adding an outgoing port index to the source-

group data structure. A source-group data structure thus updated is for intelligently forwarding

multicast packets by the layer 2 switch. For this reason, Claim 12 is directed to statutory subject

matter.

Claim 16

> Claim 16 recites:

> A method for handling a control message in a Virtual Local Area Network (VLAN), the method comprising:
> receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router;
> deriving an explicit source lookup key from the control message;

---

[4] Examination Guidelines for Computer-Related Inventions, Final Version, § IV.B.2.b.ii.
[5] Specification at ¶ 10.

retrieving an outgoing port index associated with an entry in a session data
structure, said entry corresponding to said explicit source lookup key; and
updating an outgoing lookup table entry corresponding to said outgoing port index
with information regarding designated devices in said multicast group
indicated by the control message.

Again, embodiments of the invention as currently claimed provide a method and system for intelligently forwarding multicast packets by a layer 2 switch.[6] This practical application is also made possible by the steps recited in Claim 16. This practical application is also reflected in Claim 16, which clearly recites the receipt of a control message at a layer 2 switch, where the control message was sent by a layer 3 router. And further, Claim 16 recites retrieving an outgoing port index associated with an entry in a session data structure, and updating an outgoing lookup table entry corresponding to the outgoing port index with information regarding designated devices in the multicast group indicated by the control message. A session data structure thus updated is for intelligently forwarding multicast packets by the layer 2 switch. For this reason, Claim 16 is directed to statutory subject matter.

Claims 25, 29, 38, and 39

Claim 25 is a means-plus-function claim corresponding to method claim 12. Claim 29 is a means-plus-function claim corresponding to method claim 16. Claim 38 is an *In re Beauregard* claim corresponding to method claim 12. Claim 39 is an *In re Beauregard* claim corresponding to method claim 16. Claims 12 and 16 being allowable, Claims 25, 29, 38, and 39 must also be allowable.

Claims 41 and 46

---

[6] Specification at ¶ 10.

Claim 41 recites:

A method for handling a control message in a Virtual Local Area Network
(VLAN), the method comprising:
receiving a control message at a layer 2 switch of said VLAN, said control
message sent by a layer 3 router;
deriving a shared source lookup key from multicast group information in the
control message;
searching a forwarding data structure for a forwarding entry having a shared
source lookup key matching the shared source lookup key;
if a forwarding entry having a shared source lookup key matching the destination
shared source lookup key is found, revising an associated outgoing port in the
forwarding entry to match an incoming port for the control message;
extracting multicast group information from the control message;
updating a source-group data structure with the multicast group information; and
adding an outgoing port index to the source-group table, the outgoing port index
identifying a port that received the control message.

Again, embodiments of the invention as currently claimed provide a method and system for
intelligently forwarding multicast packets by a layer 2 switch.[7] This practical application is also
made possible by the steps recited in Claim 41. This practical application is also reflected in
Claim 41, which clearly recites the receipt of a control message at a layer 2 switch, where the
control message was sent by a layer 3 router. And further, Claim 41 recites updating a source-
group data structure with the multicast group information, and adding an outgoing port index to
the source-group table. A source group table thus updated is for intelligently forwarding
multicast packets by the layer 2 switch. For this reason, Claim 41 is directed to statutory subject
matter.

Claim 46 recites:

A method for handling a control message in a Virtual Local Area Network
(VLAN), the method comprising:
receiving a control message at a layer 2 switch of said VLAN, said control
message sent by a layer 3 router;

_____

[7] Specification at ¶ 10.

> deriving an explicit source lookup key from the control message;
> searching a session data structure for a session entry having an explicit source
>   lookup key matching the derived explicit source lookup key; and
> if a session entry having an explicit source lookup key matching the derived
>   explicit source lookup key is found, revising an associated outgoing port in
>   the session entry to match an incoming port for the control message.

Again, embodiments of the invention as currently claimed provide a method and system for intelligently forwarding multicast packets by a layer 2 switch.[8] This practical application is also made possible by the steps recited in Claim 46. This practical application is also reflected in Claim 46, which clearly recites the receipt of a control message at a layer 2 switch, where the control message was sent by a layer 3 router. And further, Claim 46 recites if a session entry having an explicit source lookup key matching a derived explicit source lookup key is found in a session data structure, revising an associated outgoing port in the session entry to match an incoming port for the control message. A session data structure thus updated is for intelligently forwarding multicast packets by the layer 2 switch. For this reason, Claim 46 is directed to statutory subject matter.

The Examiner states:

> Claim 41 has produced result only "if a forwarding entry having a shared source lookup key matching the destination shared source lookup key is found. But, such claim has not provided ant [sic] results when " the forwarding entry..." is not found.

> Claim 46 has produced result only "if a session entry having an explicit source lookup key matching the derived explicit source lookup key is found. But, such claim has not provided any results when "the session entry ..." is not found.[9]

---

[8] Specification at ¶ 10.
[9] Office Action at pp. 3-4.

The Applicant respectfully submits the Examiner's reference to unclaimed subject matter is improper. Claim 41 is directed to the condition of if a forwarding entry having a shared source lookup key matching the destination shared source lookup key is found; it is *not* directed to the condition of if a forwarding entry having a shared source lookup key matching the destination shared source lookup key is *not* found. Likewise, Claim 46 is directed to the condition of if a session entry having an explicit source lookup key matching the derived explicit source lookup key is found; it is *not* directed to the condition of if a session entry having an explicit source lookup key matching the derived explicit source lookup key is *not* found. Thus, the Examiner's allegation of no tangible results for that which is not claimed, is improper. Accordingly, the 35 U.S.C. § 101 rejection of Claims 12, 16, 25, 29, 38, 41, and 46 must be withdrawn.

<u>Dependent Claims 13-15, 17, 26-28, 30, 42-44, 47, 50-51, 54-55, 57-59, 62-63, and 65-70</u>

The base claims being allowable, dependent claims 13-15, 17, 26-28, 30, 42-44, 47, 50-51, 54-55, 57-59, 62-63, and 65-70 must also be allowable.

<u>The 35 U.S.C. § 103 Rejection</u>

Claims 12-42, 44, 46-47 and 50 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over <u>Tang et al.</u>[10] in view of <u>Gleeson et al.</u>,[11] in view of <u>Hoffman et al.</u>,[12] among which claims 12, 16, 18, 25, 29, 31, 38-41, and 46 are independent claims.[13] This rejection is respectfully traversed.

According to the Manual of Patent Examining Procedure (M.P.E.P.),

---

[10] U.S. Patent No. 6,839,348 to <u>Tang et al.</u>
[11] U.S. Patent No. 5,959,989 to <u>Gleeson et al.</u>
[12] U.S. Patent No. 6,094,435 to <u>Hoffman et al.</u>
[13] Office Action at p. 4.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure.[14]

Claim 12

Claim 12 recites:

A method for handling a control message in a Virtual Local Area Network (VLAN), the method comprising:
receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router;
updating a source-group data structure using information from the control message, the source-group data structure containing data regarding a multicast group; and
adding an outgoing port index to said source-group data structure, said outgoing port index identifying a port that received the control message.

The Examiner states:

... Gleeson shows a method comprising: updating a source-group data structure using information from the control message, the source-group data structure containing data regarding a multicast group [See Fig. 2c of Gleeson, which is a "source-group data structure." It contains multicast group address. See lines 21-32 in column 2 of Gleeson. See lines 30-35 in column 16 for the step of updating the data structure]; and adding an outgoing port index to data source-group data structure, said outgoing port index identifying a port that received the control message [See Fig. 2C, which lists a port index ('port number') in the table. Inserting the source group necessarily adds a port number, because the data structure includes a field for the "port index."]. Tang and Gleeson show substantially all the limitations, but fail to specifically show the step of receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router. However, Hoffman discloses an analogous system and method for a quality of service in a multi-layer network element, which discloses the step of receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router (figs. 1 - 4; col. 7, line 32 through col. 8, line 61; col. 9, lines 27 - 47, col. 11, line 3 through col. 12, line 6). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Tang and Gleeson by receiving a control message at a

_____

[14] M.P.E.P § 2143.

layer 2 switch of said VLAN, said control message sent by a layer 3 router as evidenced by Hoffman for the purpose of intelligently forwarding received packets to one or more appropriate output ports, thereby providing a system and method for handling multicast packets quickly and efficiently in a multi-layer network element.[15]

The Applicant respectfully disagrees. Contrary to the Examiner's statement, Hoffman et al. does not disclose receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router as required by Claim 12. In support of the Examiner's contention, the Examiner refers to portions of Hoffman et al. that refer generally to the processing of content packets. But nowhere does Hoffman et al. disclose receiving a *control* message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router as required by Claim 12. For instance, Hoffman et al. mentions neither "Hello" messages nor "join/prune" messages, which are examples of control messages. As such, the 35 U.S.C. § 103 Rejection of Claim 12 is unsupported by the art of record. For this reason, a *prima facie* case has not been established and the rejection must be withdrawn.

Claims 13-15

Claims 13-15 depend from Claim 12. The base claim being allowable, the dependent claims must also be allowable.

Claim 16

Claim 16, recites:

A method for handling a control message in a Virtual Local Area Network (VLAN), the method comprising:
receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router;
deriving an explicit source lookup key from the control message;
retrieving an outgoing port index associated with an entry in a session data structure, said entry corresponding to said explicit source lookup key; and

---

[15] Office Action, pp. 5-6.

updating an outgoing lookup table entry corresponding to said outgoing port index
with information regarding designated devices in said multicast group
indicated by the control message.

The Examiner states:

... Tang and Gleeson show a method comprising deriving an explicit source
lookup key from the control message [See lines 50-67 in column 16 of Tang. S4,
which is the specific source address, is the "source lookup key."]; and retrieving
an outgoing port index associated with an entry in a session data structure, said
entry corresponding to said explicit source lookup key ["Session data structure"
are the rows, in the multicast routing table ("forwarding table"). Each entry of the
outgoing interface list is associated with an interface ("outgoing port index")
shown in Fig. 3. The retrieval is performed by looking up the forwarding table];
and updating an outgoing lookup table entry corresponding to said outgoing port
index with information regarding designated devices in said multicast group
indicated by the control message [See Fig. 3 of Tang. The outgoing lookup table
entry is either IIF or OIF in the multicast routing table. It is updated in accordance
with the description, starting at line 16, column 16 to line 17, in column 19].
Tang and Gleeson show substantially all the limitations, but fail to specifically
show the step of receiving a control message at a layer 2 switch of said VLAN,
said control message sent by a layer 3 router. However, Hoffman discloses an
analogous system and method for a quality of service in a multi-layer network
element, which discloses the step of receiving a control message at a layer 2
switch of said VLAN, said control message sent by a layer 3 router (figs. 1 -4; col.
7, line 32 through col. 8, line 61; col. 9, lines 27 - 47, col. 11, line 3 through col.
12, line 6). Thus, it would have been obvious to one of ordinary skill in the art at
the time the invention was made to modify the teachings of Tang and Gleeson by
receiving a control message at a layer 2 switch of said VLAN, said control
message sent by a layer 3 router as evidenced by Hoffman for the purpose of
intelligently forwarding received packets to one or more appropriate output ports,
thereby providing a system and method for handling multicast packets quickly and
efficiently in a multi-layer network element.[16]

The Applicant respectfully disagrees. The arguments made with respect to Claim 12 apply here

as well. Contrary to the Examiner's statement, Hoffman et al. does not disclose receiving a

control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router

as required by Claim 16. As such, the 35 U.S.C. § 103 Rejection of Claim 16 is unsupported by

the art of record. For this reason, a *prima facie* case has not been established and the rejection

must be withdrawn.

Claim 17

Claim 17 depends from Claim 16. The base claim being allowable, the dependent claim

must also be allowable.

Claim 18

Claim 18, recites:

A method for handling a control message in a Virtual Local Area Network
(VLAN), the method comprising:
receiving a control message at a layer 2 switch of said VLAN, said control
message sent by a layer 3 router;
determining if the control message establishes shared source distribution trees or
explicit source distribution trees;
updating a source-group data structure using information from the control
message, the source-group data structure containing data regarding a
multicast group, if the control message establishes shared source distribution
trees;
adding an outgoing port index to said source-group data structure, said outgoing
port index identifying a port that received the control message if the control
message establishes shared source distribution trees;
deriving an explicit source lookup key from the control message if the control
message establishes explicit source distribution trees;
retrieving an outgoing port index associated with an entry in a session data
structure, said entry corresponding to said explicit source lookup key if the
control message establishes explicit source distribution trees; and
updating an outgoing lookup table entry corresponding to said outgoing port index
with information regarding designated devices in said multicast group
indicated by the control message if the control message establishes explicit
source distribution trees.

The Examiner states:

... Tang and Gleeson show a method comprising determining if the control
message establishes shared source distribution trees or explicit source distribution
trees [The step is inherent in Tang. Tang's system responds differently depending
on the source address, whether it is shared source distribution tree or it is an
explicit source distribution tree. If it is a shared distribution tree, the system
follows the steps described from line 16, column 15 to line 13, column 16 in
Tang. If the message is an explicit one, Tang's system follows the steps described
from line 14, column 16 to line 19, column 19]; Other limitations of claim 18 are

---

[16] Office Action, pp. 6-8.

same as those of claims 12 and 16, with one difference. The limitations which correspond to those in claim 12 are different than those of claim 12 because of an additional clause, "if the control message establishes shared source distribution trees." Gleeson still meets the limitations, because the steps (which correspond to the limitations of claim 12) apply to both shared source distribution and non-shared. Tang and Gleeson show substantially all the limitations, but fail to specifically show the step of receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router. However, Hoffman discloses an analogous system and method for a quality of service in a multi-layer network element, which discloses the step of receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router (figs. 1 - 4; col. 7, line 32 through col. 8, line 61; col. 9, lines 27 - 47, col. 11, line 3 through col. 12, line 6). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Tang and Gleeson by receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router as evidenced by Hoffman for the purpose of intelligently forwarding received packets to one or more appropriate output ports, thereby providing a system and method for handling multicast packets quickly and efficiently in a multi-layer network element.[17]

The Applicant respectfully disagrees. Claim 18 includes limitations similar to Claim 12 and 16. Thus, the arguments made above with respect to Claims 12 and 16 apply here as well.

Additionally, the Applicant respectfully submits that the rejection of Claim 18 lacks the clarity required by the M.P.E.P.[18] The rejection of Claim 18 refers to "other limitations of claim 18 are same as those of claims 12 and 16," without identifying the precise elements to which the Examiner intends to refer.

The rejection of Claim 18 also appears to indicate that Tang et al. discloses performing a first set of actions only if the control message establishes shared distribution trees, and performing a second set of actions only if the control message establishes explicit source distribution trees, and further that Gleeson et al. discloses performing the first set of actions

---

[17] Office Action, pp. 8-9.

[18] See M.P.E.P. § 707.07(f) ("In order to provide a complete application file history and to enhance the clarity of the prosecution history record, an examiner must provide clear explanations of all actions taken by the examiner during prosecution of an application."). See also M.P.E.P. § 707.07(d) ("Where a claim is refused for any reason relating to the merits thereof it should be 'rejected' and the ground of rejection fully and clearly stated, and the word 'reject' must be used.").

regardless of whether the control message establishes shared source distribution trees or explicit

source distribution trees. If so, the Examiner's statements reveal one reason why Tang et al.,

which incorporates Gleeson et al., does not anticipate Claim 18, is non-enabling, or both.

Claims 19-24

Claims 19-24 depend from Claim 18. The base claim being allowable, the dependent

claims must also be allowable.

Claim 23

Claim 23, recites:

The method of Claim 18, further comprising:
determining if the control message is a hello or join/prune message; and
performing said determining, updating a source-group data structure, adding,
     deriving, retrieving, and updating an outgoing lookup table entry only if said
     control message is a join/prune message.

The Examiner states:

... Tang shows determining if the control message is a hello or join/prune message
[identification of the message type is inherent in multicast network device in
Tang. MND's implement PIM protocol. See lines 15-39, column 10] and
performing said determining, updating, a source-group data structure, adding,
deriving, retrieving, and updating an outgoing lookup table entry only if said
control message is a join/prune message. [See the above discussion of Tang in the
preceding claims. All of the preceding functions are only performed when the
message is a join message. The 'group forwarding table' 250 in Fig. 2C can only
be updated upon join/prune, because it requires subscription data changes.[19]

The Applicant respectfully disagrees. Claim 23 requires performing said determining, updating a

source-group data structure, adding, deriving, retrieving, and updating an outgoing lookup table

entry *only* if said control message is a join/prune message. (emphasis added) The Examiner has

not pointed to where Tang et al. discloses the listed actions are performed *only* if said control

message is a join/prune message.

The Applicant respectfully submits that the Examiner's statement that "[t]he 'group forwarding table' 250 in Fig. 2C can only be updated upon join/prune, because it requires subscription data changes" does not address the claimed limitations of Claim 23. First, the fact that a join/prune requires subscription data changes does not preclude the possibility that another event would also require subscription data changes. Secondly, even if the Examiner's statement is true, it does not address the requirement that the "deriving" and "retrieving" steps also be performed only if said control message is a join/prune message. For these additional reasons, the 35 U.S.C. § 103 rejection of Claim 23 based on Tang et al. in view of Hoffman et al. is unsupported by the art and must be withdrawn.

Claim 24

Claim 24, recites:

The method of Claim 23, further comprising:
creating or updating a neighbor list using said hello message, said neighbor list
    identifying address and port information regarding a device which sent the
    control message.

The Examiner states:

... Tang's device implements PIM hello [See lines 15-39, column 10].
Implementation of hello entails creating or updating a neighbor list using said
hello message, said neighbor list identifying address ad port information regarding
device, which sent the control message. In other words, the limitation merely
repeats what any system that implements hello is capable of performing.[20]

The Examiner admits that Tang et al. does not teach creating or updating a neighbor list using said hello message, said neighbor list identifying address and port information regarding a device which sent the control message, but does not provide a specific reference where such a limitation is found, instead arguing that any system that implements PIM hello would perform the recited

---

[19] Office Action, pp. 9-10.

limitation. Therefore, the Applicant assumes that the Examiner intended to take official notice of facts under M.P.E.P. § 2144.03 that the rationale supporting the rejection is based on common knowledge in the art or "well-known" prior art. Under M.P.E.P. § 2144.03, "[i]f the applicant traverses such an assertion the examiner should cite a reference in support of his or her position." The Applicant hereby traverses the assertion and request that a reference be cited in support of the position outlined in the Office Action.

Claims 25-37

Claims 25-37 are means-plus-function claims corresponding to method claims 12-24, respectively. Claims 12-24 being allowable, Claims 25-37 must be allowable for at least the same reasons.

Claims 38-40

Claims 38, 39, and 40 are *In re Beauregard* claims corresponding to method claims 12, 16, and 18, respectively. Claims 12, 16, and 18 being allowable, Claims 38, 39, and 40 must be allowable for at least the same reasons.

Claim 41

Claim 41, recites:

> A method for handling a control message in a Virtual Local Area Network (VLAN), the method comprising:
> receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router;
> deriving a shared source lookup key from multicast group information in the control message;
> searching a forwarding data structure for a forwarding entry having a shared source lookup key matching the shared source lookup key;

---

[20] Office Action, p. 10.

if a forwarding entry having a shared source lookup key matching the destination
    shared source lookup key is found, revising an associated outgoing port in the
    forwarding entry to match an incoming port for the control message;
extracting multicast group information from the control message;
updating a source-group data structure with the multicast group information; and
adding an outgoing port index to the source-group table, the outgoing port index
    identifying a port that received the control message.

The Examiner states:

... Tang shows deriving a shared source lookup key from multicast group
information in the control message [See from line 15, column 15 to line 3, column
16 in Tang. G1 is the shared source lookup key.]; searching a forwarding data
structure for a forwarding entry having a shared source lookup key matching the
shared source lookup key [See from line 15, column 15 to line 3, column 16 in
Tang. G1 is matched. See more specifically, lines 51-56, column 15]; if a
forwarding entry having a shared source lookup key matching the destination
shared source lookup key is found, revising an associated outgoing port in the
forwarding entry to match an incoming port for the control message. See lines 51-
56, column 15. Note that OIF field is revised]; extracting multicast group
information from the control message; updating a source-group data structure with
the multicast group information; and adding an outgoing port index to the source-
group table, the outgoing port index identifying a port that received the control
message (see Fig. 2C; col. 2, lines 21 - 32; col. 10, lines 21 32; and col. 16, lines
30 - 35 of Gleeson et since such reference is being incorporated in Tang for
further improvement). Tang and Gleeson show substantially all the limitations,
but fail to specifically show the step of receiving a control message at a layer 2
switch of said VLAN, said control message sent by a layer 3 router. However,
Hoffman discloses an analogous system and method for a quality of service in a
multi-layer network element, which discloses the step of receiving a control
message at a layer 2 switch of said VLAN, said control message sent by a layer 3
router (figs. 1 - 4; col. 7, line 32 through col. 8, line 61; col. 9, lines 27 - 47, col.
11, line 3 through col. 12, line 6). Thus, it would have been obvious to one of
ordinary skill in the art at the time the invention was made to modify the teachings
of Tang and Gleeson by receiving a control message at a layer 2 switch of said
VLAN, said control message sent by a layer 3 router as evidenced by Hoffman for
the purpose of intelligently forwarding received packets to one or more
appropriate output ports, thereby providing a system and method for handling
multicast packets quickly and efficiently in a multi-layer network element.[21]

The Applicant respectfully disagrees. The arguments made with respect to Claim 12 apply here

as well. Contrary to the Examiner's statement, <u>Hoffman et al.</u> does not disclose receiving a

control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router

as required by Claim 41. As such, the 35 U.S.C. § 103 Rejection of Claim 41 is unsupported by the art of record. For this reason, a *prima facie* case has not been established and the rejection must be withdrawn.

Claims 42-44

Claims 42-44 depend from Claim 41. The base claim being allowable, the dependent claims must also be allowable.

Claim 46

Claim 46, recites:

> A method for handling a control message in a Virtual Local Area Network (VLAN), the method comprising:
> receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router;
> deriving an explicit source lookup key from the control message;
> searching a session data structure for a session entry having an explicit source lookup key matching the derived explicit source lookup key; and
> if a session entry having an explicit source lookup key matching the derived explicit source lookup key is found, revising an associated outgoing port in the session entry to match an incoming port for the control message.

The Examiner states:

> ... Tang shows deriving an explicit source lookup key from the control packet [See lines 27-49, column 16. S4 is the source lookup key and it is an address]; searching a session data structure for a session entry having an explicit source lookup key matching the derived explicit source lookup key ["Session data structure" correspond to the rows, in the multicast routing table ("forwarding table"). Each entry of the outgoing interface list is associated with an interface ("outgoing port index") shown in Fig. 3. The retrieval is performed upon searching the session data structure. See from lines 27-49, column 16]; if a session entry having an explicit source lookup key matching the derived explicit source lookup key is found, revising an associated outgoing port in the session entry to match an incoming port for the control message [See Fig. 3 of Tang. The outgoing lookup table entry is either IIF or OIF in the multicast routing table. It is revised in accordance with the description, starting at line 16, column 16 to line 17, in

---

[21] Office Action, pp. 10-12.

column 19]. Tang and Gleeson show substantially all the limitations, but fail to specifically show the step of receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router. However, Hoffman discloses an analogous system and method for a quality of service in a multi-layer network element, which discloses the step of receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router (figs. 1 - 4; col. 7, line 32 through col. 8, line 61; col. 9, lines 27 - 47, col. 11, line 3 through col. 12, line 6). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Tang and Gleeson by receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router as evidenced by Hoffman for the purpose of intelligently forwarding received packets to one or more appropriate output ports, thereby providing a system and method for handling multicast packets quickly and efficiently in a multi-layer network element.[22]

The Applicant respectfully disagrees. The arguments made with respect to Claim 12 apply here as well. Contrary to the Examiner's statement, <u>Hoffman et al.</u> does not disclose receiving a control message at a layer 2 switch of said VLAN, said control message sent by a layer 3 router as required by Claim 46. As such, the 35 U.S.C. § 103 Rejection of Claim 46 is unsupported by the art of record. For this reason, a *prima facie* case has not been established and the rejection must be withdrawn.

Claims 47 and 50

Claims 47 and 50 depend from Claim 46. The base claim being allowable, the dependent claims must also be allowable.

Claim 47

Claim 47, recites:

The method of Claim 46, wherein the explicit source lookup key comprises a multicast source network address, a destination network address, an incoming port for the control message, and a protocol type.

The Examiner states:

---
[22] Office Action, pp. 12-13.

... Tang shows that the explicit source lookup key comprises a multicast source network address, a destination network address, and incoming port for the control message and a protocol type. See Fig. 3. Any element of each row in the multicast routing table maybe used as a key. Note that even though protocol type is not included in the table, Tang's feature still meets the limitation, because the limitation does not require the presence of the port type. The limitation prescribes some "combination" of "source network address, destination network address, and incoming port."[23]

The Applicant respectfully disagrees. Claim 47 recites the explicit source lookup key *comprises* a multicast source network address, a destination network address, an incoming port for the control message, and a protocol type. This is not disclosed by the cited art of record.

Additionally, contrary to the Examiner's statement, Tang et al. does not disclose the explicit source lookup key comprises an incoming port for the control message. In support of the Examiner's contention, the Examiner refers to FIG. 3 of Tang et al., which is included below for the Examiner's convenience.
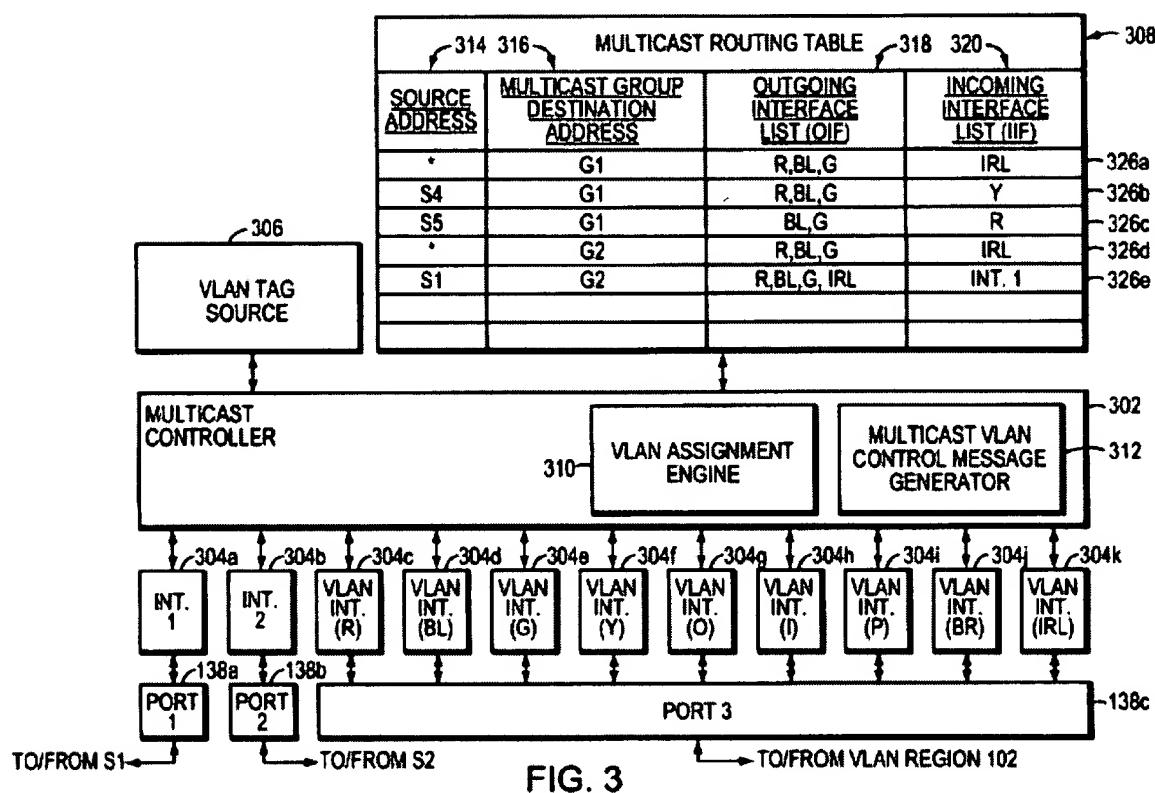
---

[23] Office Action, pp. 13-14.

SOURCE ADDRESS (314)	MULTICAST GROUP DESTINATION ADDRESS (316)	OUTGOING INTERFACE LIST (OIF) (318)	INCOMING INTERFACE LIST (IIF) (320)	
*	G1	R,BL,G	IRL	326a
S4	G1	R,BL,G	Y	326b
S5	G1	BL,G	R	326c
*	G2	R,BL,G	IRL	326d
S1	G2	R,BL,G, IRL	INT. 1	326e

MULTICAST ROUTING TABLE — 308

VLAN TAG SOURCE — 306

MULTICAST CONTROLLER — 302

310 — VLAN ASSIGNMENT ENGINE

MULTICAST VLAN CONTROL MESSAGE GENERATOR — 312

304a INT. 1 | 304b INT. 2 | 304c VLAN INT. (R) | 304d VLAN INT. (BL) | 304e VLAN INT. (G) | 304f VLAN INT. (Y) | 304g VLAN INT. (O) | 304h VLAN INT. (I) | 304i VLAN INT. (P) | 304j VLAN INT. (BR) | 304k VLAN INT. (IRL)

138a PORT 1 | 138b PORT 2 | PORT 3 — 138c

TO/FROM S1   TO/FROM S2   TO/FROM VLAN REGION 102

FIG. 3

Tang et al. recites:

> To forward the multicast message from entity S4, multicast controller 302 first performs a Reverse Path Forwarding (RPF) check on the received message. In particular, multicast controller 302 checks to see whether the message was received on the interface used to send unicast messages to entity S4 (i.e., the yellow VLAN interface), which is also listed in the IIF for this {S4, G1} source-specific route entry.[24]

Thus, rather than using the incoming port for the control message as required by Claim 47, Tang et al. obtains an incoming port from the incoming interface list (IIF) of a multicast routing table, where the incoming interface is derived by performing a reverse path forwarding (RPF) check on the received message. An RPF check is possible in Tang et al. because Tang et al. discloses layer 3 processing. Whereas Claim 47 recites processing on a layer 2 switch, and the tables required to perform such an RPF check are not present on layer 2 switches. For this reason, the 35 U.S.C. §

---

[24] Tang et al. at col. 16 ll. 50-56.

103 rejection of Claim 47 based on <u>Tang et al.</u> in view of <u>Hoffman et al.</u> is unsupported by the art and must be withdrawn.

<u>Claim 50</u>

The Examiner states:

Claim 50 substantively incorporates the limitations of claim 45, and the reasons for the rejection of claim 45 apply to claim 50.[25]

Claim 45 was previously cancelled without prejudice or disclaimer. Accordingly, the Applicant respectfully submits the present rejection of Claim 50 based on alleged similarities to cancelled claim 45 is improper. For this additional reason, the 35 U.S.C. § 103 Rejection of Claim 50 must be withdrawn.

<u>Claims 51 - 70</u>

The Examiner states:

With respect to claims 51 - 70, their limitations already have been discussed with claims 12-44, 46 - 47, and 50 respectively.[26]

The Applicant respectfully disagrees. Contrary to the Examiner's statement, the limitations of Claims 51-70 were not previously addressed by the Examiner in the rejection of Claims 12-44, 46-47, and 50. Claims 51-58 recite wherein incoming ports and outgoing ports of said switch form part of said VLAN; this limitation was not previously addressed in the Office Action. Claims 59-66 recite wherein said control message comprises a <u>layer 3</u> control message. (emphasis added) Claims 67-70 recite numerous details of the forwarding memory that were not

---

[25] Office Action at p. 14.
[26] Office Action at p. 14.

addressed in earlier claims. The Examiner is reminded that the mere absence from a reference of

an explicit requirement of a claim cannot be reasonably construed as an affirmative statement

that the requirement is in the reference.[27] For these additional reasons, the 35 U.S.C. § 103

Rejection of Claims 51 – 70 is unsupported by the art and must be withdrawn.

In view of the foregoing, it is respectfully asserted that the claims are now in condition

for allowance.

---

[27] *In re Evanega*, 829 F.2d 1110, 4 USPQ2d 1249 (Fed. Cir. 1987).

Conclusion

It is believed that this Amendment places the above-identified patent application into condition for allowance. Early favorable consideration of this Amendment is earnestly solicited.

If, in the opinion of the Examiner, an interview would expedite the prosecution of this application, the Examiner is invited to call the undersigned attorney at the number indicated below.
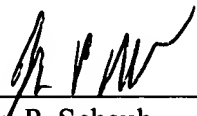
The Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Please charge any additional required fee or credit any overpayment not otherwise paid or credited to our deposit account No. 50-1698.

Respectfully submitted,

THELEN REID BROWN
RAYSMAN & STEINER LLP

Dated: July 19, 2007

John P. Schaub
Reg. No. 42,125

THELEN REID BROWN RAYSMAN & STEINER LLP
P.O. Box 640640
San Jose, CA 95164-0640
Tel. (408) 292-5800
Fax. (408) 287-8040